CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

Index

abduction, 26
abductive inference 26
  see abductive reasoning
abductive learning, 223
abductive reasoning, 5–8, 26, 57
  Doyle's interpretation, 8
  Peirce's interpretation, 7
abstract task, 399
abstraction
  pattern, 330
  of probabilistic solution, 330
  of reasoning, 329–31
  of reasoning tree, 330–1
  of statement, 329–30
access, 135
accuracy, 49
  of demonstrative tangible evidence, 134
action, 395
  add effects, 395
  delete effects, 395
  example, 395
  resources, 395
Adam, Federic, 32
agent
  cognitive, 31
  cognitive assistant, 33–4
  intelligent, 30, 34
  knowledge-based, 30, 33–4
agent development
  ontology, 106
  optimization, 107
  rapid prototyping, 105
  rule learning and ontology refinement, 106
  specification, 105
  use and personalization, 106
agent teaching and learning
  for center of gravity analysis, 380–3
  for course of action critiquing, 355–60
  for emergency response planning, 403–17
  for workaround planning, 345–6
Allemang, Dean, 33, 40, 89
Allen, James, 391, 425
analogical problem solving
  based on explanation similarity, 265
analogy criterion, 266–70
analogy-based generalization, 265–70
analysis
  definition, 35
analysis and synthesis, 113–24
  inquiry-driven, 113–22
    for center of gravity determination, 116
    for evidence-based reasoning, 122
  problem solving, 113–15
  symbolic integration, 113
analytic task, 36
  classification, 36
  critiquing, 36
  diagnosis, 36
  intelligence analysis, 36
  interpretation, 36
  monitoring, 36
  prediction, 36
Anderson, Terence, 5
Apple, 35
approximate reasoning, 21
arch of knowledge, 5, 26
argument
  direction, 54
  force, 54
Aristotle, 6
artificial intelligence, 29–33
  definition, 29
assumption, 18
assumption-based reasoning, 143
authenticity, 49
  of demonstrative tangible evidence, 134
  of real tangible evidence, 134
authoritative record, 137
Awad, Elias M., 88, 178–9, 389, 418

Bacon, Francis, 16
Baconian inference
  different tests of hypotheses, 16
  eliminating hypotheses, 16
Baconian probability system, 16–20, 55
  compared with others, 23–5
  intersection, 20
  negation, 20
  union, 20
Bayes, Thomas, 10

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

Bayes' rule, 10
  and assumptions, 18
Bayesian network learning, 223
Bayesian probability system, 11–13, 55
  and assumptions, 18
  compared with others, 23–5
Belief Functions, 11–16, 55
  and assumptions, 18
  compared with others, 23–5
believability, 61
  versus credibility, 135
  of evidence, 48
    example, 49
  of source, 48, 54
believability assessment, 133–9
believing as if. *See* assumption
benefit of the doubt, 19
Betham, Jeremy, 27
BFO, 90
big data problem, 50
Boicu, Cristina, 41, 338
Boicu, Mihai, 39, 41, 338, 352, 364, 407
Bowman, Michael, 41, 338, 352, 396
Bresina, John L., 34
Breuker, Joost, 35
browsing of reasoning tree, 331
BRU generalization, 246
Buchanan, Bruce G., 83–4, 87, 389, 418

candidate elimination algorithm, 298
Carbonell, Jaime G., 225
card sort method, 179
case-based reasoning and learning, 223
causal network of relations, 225, 265
certification, 88
chain of custody, 138–9
chain of reasoning, 4
Chaudhri, Vinay K., 90
Chipman, Michael A., 34
Clancey, William, 35
class. *See* concept
clause generalization, 245
Clausewitz, Carl von, 365
CLIPS, 88
clustering, 223
Cohen, Jonathan L., 16–18
Cohen, Morris R., 6
Cohen, Paul, 346, 349
collaborative autonomous agents, 70
combinatorial explosion, 51
Comello, Jerome, 376
COMINT, 133–4
CommonKADS, 89
competence, 3, 49, 135
competing hypotheses, 59
computational theory of evidence-based reasoning, 64
concept
  definition, 156
  as feature value, 163
  formal representation language, 243–5
  representation, 203
concept elicitation, 176–9
conditional probability, 11
connecting the dots, 46–55
  definition, 47
  example, 47
Cooper, Thomas A., 88
credibility, 135
  versus believability, 135
critical reasoning, 48
Cross, Stephen E., 34
customer, 55
cyber insider threat, 64–7
  definition, 64
Cyc, 88, 90

Dale, Andrew I., 10
DARP, 34
data, 1
David, F. N., 10
David, Paul A., 33
Davies, Todd R., 225
decision trees induction, 223
deduction, 25
deduction, induction, and abduction, 50
deductive inference 26
  see deductive reasoning
deductive reasoning, 26
Deep Blue, 34
defensibile argument, 54
DeJong, Gerald, 258, 406
DENDRAL, 34
Desai, Mita, 68
design principle, 426–32
  complete life cycle, 431
  employ learning technology, 426
  knowledge adaptation, 429
  knowledge reuse, 427
  mixed-initiative, 429
  multi-agent and multidomain problem solving, 427
  multistrategy learning, 428
  plausible reasoning, 430
  problem solving for collaboration, 427
  rapid development, 430
  teaching and learning, 428
  user tutoring, 430
direct subconcept of
  definition, 157
disbelief. *See* lack of belief
Disciple agent, 426
Disciple-CD, 35–6, 41
Disciple-COA, 36, 89, 348–64
Disciple-COG, 34, 91, 364–85, 427
  Script Editor, 377
Disciple-EBR, 41, 49, 53, 55, 91, 257, 309, 427
  Association Browser, 165
  Expression Editor, 282
  Feature Browser, 167, 175, 189
  Feature Editor, 175
  Hierarchical Browser, 165, 182

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

Object Browser, 165, 175, 180
Object Editor, 192–3
Object Viewer, 165
Rule Browser, 254
Disciple-LTA, 36
Disciple-VE, 390–4
Reasoning Hierarchy Browser, 396
Reasoning Step Editor, 396
Disciple-VPT, 37, 387–425, 427
architecture, 388–9
VE Assistant, 388
VE Library, 388, 416–20
VE Team, 388
Disciple-WA, 37, 89, 338–48
divide-and-conquer. *See* analysis and synthesis
DOLCE, 90
domain understanding, 83–5, 94, 176–9
dots
evidential, 47–8
combinations of, 50
idea, 48, 50, 52, 54
Doyle, Arthur Conan, 6
drill-down analysis, 143
Drucker, Peter, 33
Durham, Susan, 391
Durkin, John, 34, 389, 418
Dybala, Tom, 40, 338

Echevarria, Antulio J., 365
Eco, Umberto, 8
Eikmeier, Dale C., 365
Einstein, Albert, 21
elicitation script, 376–9
for feature, 377
illustration, 367–9
EMYCIN, 89
enumerative probability, 9–11
aleatory, 9
epistemology, 2
equivocal testimonial evidence, 136
evaluation
of Disciple-COA, 360–4
of Disciple-COG, 383–5
of Disciple-VPT, 422
of Disciple-WA, 346–8
event, 2
evidence, 1, 5
ambiguity, 23
dissonance, 23
imperfect believability, 23
incompleteness, 23
inconclusiveness, 23
versus
event, 48
fact, 2
information, 2
knowledge, 2
evidence collection task, 60
evidence in search of hypotheses, 56–7
evidence-based assessment, 122–4
evidence-based reasoning, 25–9, 46–76
in cybersecurity, 27
in forensics, 27
in intelligence analysis, 27
in law, 27
in medicine, 27
in natural sciences, 27
evidential synergism, 52
example, 50–1
Except-When plausible version space condition, 215, 251, 254–5, 300
EXPECT, 88
expert problem
center of gravity analysis, 364–7
course of action critiquing, 348–51
emergency response planning, 389–90
workaround planning, 338–41
expert system, 33–5
definition, 33–4
vs knowledge-based system, 34
expert system shell, 88–9
definition, 88
explanation, 266
with comparison, 283
with fixed value, 280
with function, 280
generation, 262–4
incompleteness, 263
explanation piece, 261
association, 261
correlation, 261
generalization, 261
property, 261
relation, 261
specific value, 261
explanation-based learning, 223–5

fact, 2
failure explanation, 254
Farquhar, Adam, 90
Feigenbaum, Edward A., 38
Fellbaum, Christiane D., 90
Ferrucci, David, 34
Filip, Florin G., 32–3
flash of insight, 7
FOAF, 90
Foray, Dominique, 33
Forbes, 34
Forbus, Kenneth D., 225
foundational ontology. *See* upper ontology
frame, 15
frame of discernment, 15
Friedman-Hill, Ernest, 90
Fuzzy probability system, 20–3, 55
compared with others, 23–5
conjunction, 22
disjunction, 22
negation, 22

Galilei, Galileo, 6
Galvin, T. P., 365
game of chance, 9

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

Gammack, J.G., 176, 180
Ganascia, Jean-Gabriel, 237, 265, 298
Gates, Bill, 40
generalization, 18
  of concepts with negation, 247
  definition, 234
  formal definition, 243–7
  inductive, 18
  maximal, 266–7, 300
  minimal, 268, 298, 300
    definition, 234
    of two concepts, 236
  of two concepts
    definition, 236
generalization hierarchy, 157–8
generalization rule, 229–33
  climbing generalization hierarchies, 231
  definition, 229
  dropping conditions, 231
  extending discrete sets, 232
  extending intervals, 231
  extending ordered sets of intervals, 231
  extending symbolic probabilities, 232
  turning constants into variables, 230
  turning occurrences of a variable into different variables, 230
  using feature definitions, 233
  using inference rules, 233
  using substitutions, 247
generic instance, 104, 183, 188
  and explanation selection, 263
genetic algorithms and evolutionary computation, 223
Gentner, Dendre, 225
Geonames, 90
GFO, 90
Ghallab, Malik, 387, 394, 396, 425
Ghaziri, Hassan M., 389, 418
Giarratano, Joseph, 34, 88
Gil, Yolanda, 90, 360
Giles, P. K., 365
giving benefit of the doubt. *See* assumption
goal, 396
Goodman, David, 34
Gruber, Tom R., 155
guideline
  abstraction
    define context-dependent names, 334
  knowledge base
    one KB in memory, 111
    save succesive KB versions, 111
  modeling
    define reduction considering future changes, 149
    identify instances and constants, 148
    learn and reuse patterns, 149
    reduction tree development, 148
    use specification to structure modeling, 147
  ontology development
    categories as concepts, 195
    concept naming, 189
    define feature-specific names, 196
    define similar siblings, 186
    group similar siblings, 187
    naming conventions, 188
    n-ary relations, 196
    single subconcepts, 187
  planning
    goal specification, 400
    plausible task ordering, 398
    preconditions specification, 399
    top-down, left-to-right specification, 399
  rule and hypothesis learning
    avoid learning from overly specific examples, 286
    avoid learning without explanations, 288
    domains and ranges of features, 286
    extend ontology before learning, 286
    guide explanation generation, 288
    identify entities before learning, 285
    recognize concepts in tree, 288
  rule refinement
    assess similar hypotheses, 321
    extend ontology for failure explanations, 321
Guizzardi, G., 90

hands-on exercise
  abstraction of reasoning, 331–4
  argumentation browsing, 76–81
  believability analysis, 140–3
  evidence search, 130–3
  feature hierarchy development, 189–92
  hypothesis analysis, 124–30
  instance definition, 192–5
  modeling and formalization, 144–6
  object hierarchy development, 180–6
  ontology browsing, 165–8
  pattern reuse, 146–7
  rule and hypothesis learning, 275–9
  rule refinement, 319–21
Hayes-Roth, Frederick, 202
Hendler, Jim, 33, 40, 89
heuristic, 62
Hieb, Michael R., 41, 338
hierarchical task network planning, 394–403
  integration with inference, 403
Hobbs, Jerry R., 90
Holmes, Sherlock, 6, 8, 47, 51
Horvitz, Eric, 32
HUMINT, 48–9, 139
Humphreys, B.L., 90
hypothesis
  examples, 29
  learning, 271–6
    basic steps, 273
  refinement, 316–17
  testing, 59
hypothesis-driven evidence collection, 59

IBM, 34
imaginative reasoning, 48, 57
IMINT, 48, 133–4

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

Incident Command System, 390
incremental inductive generalization, 299
indicator
  almost certain indicator, 121
  likely indicator, 121
  probability computation, 121
  very likely indicator, 121
individual. *See* instance
induction, 25
inductive inference 26
  see inductive reasoning
inductive learning from examples, 223–4, 238–42
  problem definition, 239
inductive reasoning, 26
inference
  action, 401
  engine, 207
  network, 53
  task, 401
inferential catastrophes, 49
inferential force or weight, 61
information, 2
inheritance, 162–3
  default, 162
  multiple, 162
input variable, 408
inquiry-based learning in science, 70–6
instance
  definition, 157
instance of, 157
instance-based learning, 223
integrated teaching and learning, 39
intelligence analysis, 56–64
intelligent agent, 30–2
interview with expert
  structured, 177
  unstructured, 84, 177
    dichotomous questions, 177
    multiple-choice questions, 177
    ranking scale questions, 177
Intuit, 34
Iron, Richard, 365
isa. *See* subconcept of

Jackson, Peter, 389, 418
Java, 41
Jena, 89–90
JESS, 89
Jones, Eric, 338, 347, 349–50, 361–2

Kant, Immanuel, 35
Keeling, Harry, 39, 41, 338
Keene, Raymond, 34
Kent, Sherman, 23
Kim, Jihie, 360
Kipling, Rudyard, 113, 427
Kneale, W., 6
knowledge
  as justified true belief, 2–4
  repository, 104–5
  reuse, 418, 427
knowledge base
  development, 257
  Domain KB, 104, 270, 420, 428
  maintenance, 257
  Scenario KB, 104, 270, 420, 428
  Shared KB, 104, 420, 428
  State KB, 420
knowledge engineer, 256, 426
  definition, 83
knowledge engineering, 33–41, 426
  definition, 33
knowledge society, 40
Kodratoff, Yves, 39, 237, 265, 298
Kolmogorov, Andrey N., 10, 14
Kolmogorov's axioms of probability, 10
Krogh, Georg von., 39

lack of belief, 15
Langley, Patrick W., 31
Laplace, Pierre, 9
law, 5
  Anglo-American, 5
laws of large numbers, 10
Le, Vu, 41, 338
learner
  aggressive, 241, 266
  cautious, 240, 268
  dual-strategy, 241
learning
  with evolving ontology, 309–20
  with incomplete representation language, 242
learning agent shell, 90–1, 390
  definition, 90
learning agent shell for evidence-based reasoning, 91–3
  definition, 91
learning apprentice, 223
learning by analogy, 39, 223, 225–6
learning from examples, 39
learning from explanations, 39
learning planning rules, 417
  action concretion rules, 415–17
  correlated rules, 409–13
  difficulty, 409
  method, 413
  problem definition, 413
  task concretion rules, 414–15
  task reduction rules, 413–14
Lempert, R. O., 134
Lenat, Douglas B., 90, 360
likelihood
  versus likeliness, 122
likelihood ratio, 12
likeliness
  versus likelihood, 122
Lindberg, D. A. B., 90
Locke, John, 6
Loom, 90, 343
lower bound condition
  as analogy criterion, 268–70

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

MacGregor, Robert, 90, 343, 360
machine learning
  definition, 223
main plausible version space condition, 215, 251
MAPGEN, 34
Marcu, Dorin, 41, 338
Marcus, Sandra, 37, 89
MASINT, 48, 133
Masolo, C., 90
McDermott, John, 34
McGuinness, Deborah L., 174
Meckl, Steven, 29
Michalski, Ryszard S., 39, 222, 227
Minsky, Marvin, 222
missing evidence, 137
  versus negative evidence, 137
Mitchell, Tom M., 212, 222, 238, 258, 298, 318, 407
mixed evidence, 14, 138
  example, 138
mixed-initiative
  interaction, 252
  problem solving, 39
  reasoning, 32–3, 262
    definition, 32
    in explanation generation, 264
modeling the problem-solving process, 113–22
  center of gravity analysis, 369–74
  course of action critiquing, 351–74
  emergency response planning, 394–6
  workaround planning, 341–3
modeling-based ontology specification, 100–1, 179–81, 286
Mooney, Ray, 258, 406
more general than
  definition, 157
Morris, Jon, 25
Morris, Paul H., 34
multi-INT fusion, 61
multistrategy learning, 39, 223, 226–7
Murphy, Peter, 5
Musen, Mark A., 89
MYCIN, 34

Nagle, Ernest, 6
naïve Bayes learning, 223
narrative, 55
n-ary feature, 160–1
NASA, 34
National Science Education Standards, 70
Nau, Dana, 366, 425
negative evidence, 136
  versus missing evidence, 137
negative example, 223
  definition, 227
negative exception
  definition, 228
Negoita, Constantin V., 21
neural networks, 223
Newton, Isaac, 6
Nilsson, Nils J., 391
Nonaka, Ikujiro, 39
Norvig, Peter, 30
Noy, Natalya F., 174

O'Keefe, R. M., 88
object feature, 158–60
  domain, 158
  generalization hierarchy, 160
  partially learned, 159
  range, 158
objectivity, 4, 49, 135
Obrst, Leo, 90, 174
observational sensitivity, 49, 135
OCHRE, 90
odds, 10
OKBC, 90
Oldroyd, David, 5, 26
Ontolingua, 90
ontological commitment, 155
ontology, 155–65
  definition, 155
  of evidence, 134
  maintenance, 197
  matching, 163–5
  of problem-solving tasks, 35–7
  version, 311
ontology design and development, 174–81
  for center of gravity analysis, 376–8
  for course of action critiquing, 352–5
  for emergency response planning, 357–90
  for workaround planning, 343–4
operation with assumption
  define, 146
  define with justification, 146
  delete, 146
operation with case study
  end, 80
  run, 78
operation with explanation
  define with comparison, 284
  define with function, 283
  generate with fixed value, 280
  guide generation, 279
operation with hypothesis
  associate search criteria, 132
  browse analysis of hypothesis, 78
  convert between modeled and formalized, 146
  define explanations, 275
  display with problem viewer, 279
  insert intermediary hypothesis, 145
  introduce into abstract reasoning tree, 334
  modify abstraction, 334
  move hypotheses, 145
  remove from abstract reasoning tree, 334
  specify, 145
  specify by instantiating pattern, 147
  specify reduction by reusing pattern, 147
  update name of elementary hypothesis, 129
operation with item of evidence
  assess, 127
  associate to hypothesis, 127
  define, 143

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

operation with knowledge base
  close, 110
  create, 110
  load and select, 108
  save, 109
operation with ontology
  add direct subconcept or instance, 194
  add direct superconcept, 194
  change feature domain, 190
  change feature range, 190
  define concept or instance, 182
  define feature, 189, 193
  define generic instance, 183
  define specific instance, 182
  delete concept or instance, 186
  rename concept or instance, 186
  view feature definition, 167
  view object, 167
operation with reasoning tree
  define instances and constants, 145
  delete node, 145
  recognize concepts, 289
  replace generated step with modeling step, 320
  select synthesis function, 129
  specify node, 145
operation with rule
  delete with Rule Browser, 321
  display with Rule Viewer, 278
  learning steps, 278
  refine with negative example, 320
  refine with positive example, 319
  view with Rule Browser, 320
OPS, 88
ordered symbolic probability scale, 61
output variable, 408
overgeneralization, 242
OWLIM, 90

Pan, Feng, 90
Paris, Cecile, 88
partially learned knowledge, 212–16
  reasoning, 215–16
  representation, 212–15
    concepts, 212–13
    features, 159, 213
    hypotheses, 214
    rules, 214
pattern learning, 95–8
  versus rule learning, 102
Peirce, Charles S., 6–8
Pellet, 89–90
personalized learning, 430
planning, 387
  collaborative, 420–1
  multidomain, 420–1
plausible explanation, 262
plausible lower bound condition, 298, 406
plausible upper bound condition, 405
plausible version space, 213, 300
Plotkin, G. D., 237
Pomerol, Jean-Charles, 32
positive example, 223
  definition, 227
positive exception
  definition, 227
possibility function, 21
posterior odds, 12
posterior probability, 11
Powell, Gerald M., 391
prior probability, 11
probabilistic reasoning, 25
probabilistically equivocal testimonial evidence, 136
probability scale
  Baconian, 17
  conventional, 15
  degree of support or belief, 15
problem reduction rule, 204
production system architecture, 202–3
propose-and-revise, 89
Protégé, 89–90
protocol analysis, 178
pure evidence, 13–14

R1, 34
Ralescu, Dan A., 21
rapid prototyping, 93–100
Rationale system, 23
reduction
  indicator, 121
  necessary and sufficient condition, 120
  scenario, 120
  sufficient condition, 120
reduction example
  generalized, 270–1
  reformulation, 264–5
  understanding, 260–2
reduction rule, 204–7, 394
reformulation rule
  definition, 229
relative frequency, 9
relevance, 53, 61
  argument, 4, 54
  of event, 50
reliability
  of demonstrative tangible evidence, 134
repeatable process, 9
report generation, 374, 430
requirements specification, 85, 93
Ressler, J., 90
Riley, Gary, 34, 88
Rooney, David, 32
Roosevelt, Franklin D., 21
rote learning, 223
rule analysis, 270
rule and ontology matching, 207–12
rule induction, 223
rule learning, 252–71
  basic steps, 260
  features, 317
  illustration, 253–7
  for inference tasks, 403–9

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

rule learning (cont.)
  method overview, 258–60
  versus pattern learning, 102
  problem definition, 257–8
rule refinement, 294–309
  through condition specialization
    illustration, 305–8
    method, 307
  with Except-When conditions
    basic steps, 305
    illustration, 300–5
  features, 317
  illustration, 253–7
  method overview, 295–6
  with negative examples, 300–9
    summary, 308
  with positive examples, 296–300
    illustration, 296–9
    method, 298–300
    summary, 300
  problem definition, 294
rule regeneration
  on demand, 310–12
  illustration, 312–16
  method, 316–20
  problem definition, 309–11
Russell, Stuart J., 30, 225

SALT, 89
Schmidt, C.F., 391
Schneider, Luc, 90
Schreiber, Guus, 33, 35–6, 89
Schum, David A., 6, 11, 16, 20, 22, 25, 29, 46, 55, 61, 133, 135, 138
Sebeok, Thomas, 8
Semantic Web, 40, 90, 174
Shafer, Glenn, 13–14, 23
Shortliffe, Edward H., 34
siblings, 186–7
  definition, 186
SIGINT, 48, 133–4
Simon, Herbert, 222
Simonite, T., 40
Siri, 35
software assistant, 40
solution synthesis rule
  problem-level, 206–7
  reduction-level, 205, 207
specialization
  minimal
    definition, 235
    of two concepts, 237
  of two concepts
    definition, 237
specialization rule, 229–34
  definition, 229
specific instance, 104, 183, 188
statistical process, 9
Stavrou, Angelos, 64
Strange, Joseph, 365, 369
subclass of. *See* subconcept of
subconcept of, 157
subject matter expert, 83, 256, 426
Subjective Bayesian. *See* Bayesian probability system
substance-blind, 133
SUMO, 90
support vector machines, 223
synthesis
  definition, 35
  problem-level, 116
  reduction-level, 116
synthesis function
  almost certain indicator, 207
  likely indicator, 207
  max, 120, 207
  min, 120, 207
  on balance, 124, 207
  very likely indicator, 207
synthesis rule, 204–7, 394
synthetic task, 36–7
  assignment, 37
  debugging, 37
  design, 37
  planning, 37
  scheduling, 37

tacit knowledge, 39
taking for granted. *See* assumption
tangible evidence, 48, 133–5
  types, 134
task, 396
  decomposition, 394
  goal, 400
  specialization, 394
Tate, Austin, 391, 424
TECHINT, 133
Tecuci, Gheorghe, 29–30, 32–4, 36–7, 39–40, 64, 91–2, 116, 148, 155, 171–2, 212, 227, 237, 262, 338, 346, 360, 362, 374, 384, 387, 391, 420–1, 430
term generalization, 245
testimonial evidence, 48, 135–7
  based on opinion, 136
  completely equivocal, 136
  obtained at second hand, 136
  unequivocal based upon direct observation, 136
testing, 256–7
TIACRITIS, 35–6, 41
Toffler, Alvin, 120, 427
TopBraid Composer, 89–90
Toulmin, Stephen E., 23
transitivity, 161
trifles, 47
truthfulness. *See* veracity
Turing, Alan, 39
Turoff, Murray, 32
type. *See* subconcept of

U.S. National Academy of Engineering, 40
U.S. National Incident Management System, 390
U.S. National Research Council, 71–2, 75–6

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-107-12256-7 — Knowledge Engineering
Gheorghe Tecuci , Dorin Marcu , Mihai Boicu , David A. Schum
Index
More Information

U.S. National Response Plan, 387
UFO, 90
UMLS, 90
underspecialization, 242
understandability, 135
unequivocal testimonial evidence, 136
UNESCO, 33
universal ontology. *See* upper ontology
upper bound condition
  as analogy criterion, 266–8
upper ontology, 90
user instance, 176
utility ontology, 90

validation, 88
Van Gelder, Tim, 23
Van Melle, W., 89
Veloso, Manuela, 225
veracity, 4, 49, 135
verbal assessments of probability, 22–3
  versus numerical, 22
verification, 88
virtual planning expert
  definition, 387
  illustration, 422

W3C, 33, 40
Wagner, G., 90
Walker, E., 34
Walton, Douglas, 43
Warden III, John A., 365
Waterman, Donald A., 202
Watson, 34
weight of evidence
  as degree of support, 13
what-if scenario, 143
Whewell, William, 6
wide-area motion imagery, 68–70
  forensic analysis, 68–9
  real-time analysis, 68
Wielinga, Bob, 35
Wigmore, John H., 23, 53
Wilkins, David C., 389, 418
Winston, Patrick H., 225, 265
Wogrin, Nancy, 88
WordNet, 90
world state
  definition, 395

Zadeh, Lofti, 8, 20

© in this web service Cambridge University Press & Assessment www.cambridge.org